

High Resolution, Radiation Tolerant Focal Plane Array for Lunar And Deep Space Applications, Phase I

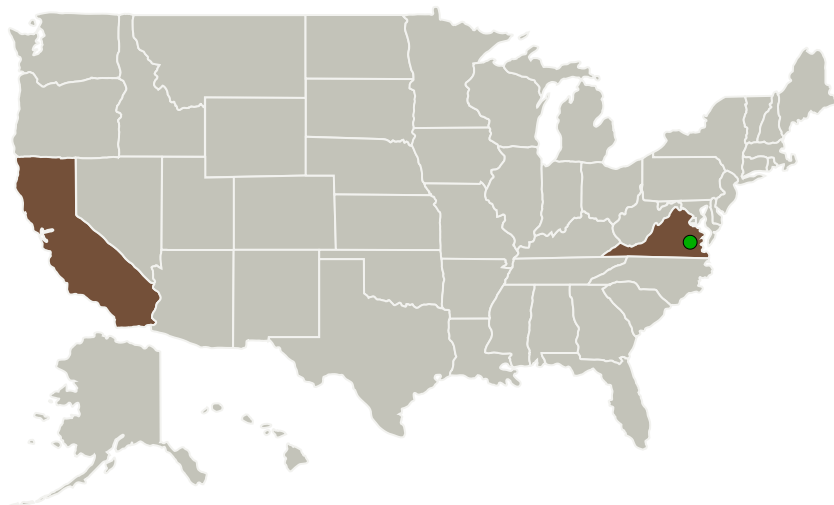
Completed Technology Project (2011 - 2011)



Project Introduction

Aerius Photonics and its partners propose the development of a high resolution, radiation hardened 3-D FLASH Focal Plane Array (FPA), with performance expected to be > 6Mrad total incident dose (TID), and will be able to perform at extremely low temperatures (-230C) without the need for a warm box. This TID performance at cold temperatures is the result of utilizing silicon germanium (SiGe) bipolar technology for the ROIC implementation, and will be the largest SiGe imaging ROIC ever designed and demonstrated. This ROIC will be hybridized with an appropriate selected detector array to produce a FPA of unprecedented TID performance. The TID performance will allow for reduced size, weight, and power (SWaP) for lunar and deep space instruments, thus saving fuel for the mission. The resulting FPA can be utilized in instruments for the Europa-Jupiter System Mission (EJSM), including the near-IR imaging spectrometer, and wide angle, high resolution camera (HRC). It can also be used in flash lidar applications for 3-D mapping to help with hazard avoidance, and for a rover operating during the lunar night in one of the permanently dark polar craters, where optical (passive) cameras could not operate.

Primary U.S. Work Locations and Key Partners



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Organizations Performing Work	Role	Type	Location
Aerius Photonics, LLC	Lead Organization	Industry	Ventura, California
● Langley Research Center(LaRC)	Supporting Organization	NASA Center	Hampton, Virginia

Primary U.S. Work Locations	
California	Virginia

Project Transitions

February 2011: Project Start

September 2011: Closed out

Closeout Documentation:

- Final Summary Chart(<https://techport.nasa.gov/file/138217>)

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Organization:

Aerius Photonics, LLC

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

Project Management

Program Director:

Jason L Kessler

Program Manager:

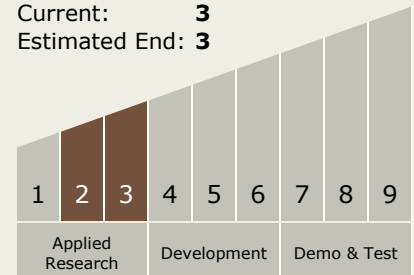
Carlos Torrez

Principal Investigator:

Lloyd Linder

Technology Maturity (TRL)

Start: 2
Current: 3
Estimated End: 3



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Technology Areas

Primary:

- TX08 Sensors and Instruments
 - └ TX08.1 Remote Sensing Instruments/Sensors
 - └ TX08.1.1 Detectors and Focal Planes

Target Destinations

The Sun, Earth, The Moon, Mars, Others Inside the Solar System, Outside the Solar System